

Claims

- [c1] 1. A method for carrying out a negotiation between a plurality of participants, comprising:
defining an invocation pattern for each participant; each invocation pattern being a tuple having at least a name and a set of parameters;
attaching a set of coordinator parameters to each invocation pattern; the set of coordinator parameters defining interdependencies between parameters of the plurality of participants that are shared across their invocation patterns;
constructing a graph to negotiate a set of actions to be performed by selected ones of the plurality of participants; the graph being constructed with nodes of one of a first node type representing a negotiating context and a second node type representing a decision point;
wherein the graph is constructed by the participants with primitives instantiated by the invocation patterns that are used to negotiate values of parameters; and
wherein at least one node in the graph is a decision point that merges two or more negotiation contexts into a single decision point; the single decision point combining values of the parameters from the two or more negotiation contexts.
- [c2] 2. The method according to claim 1, wherein properties of each parameter are defined by a set of one or more aspects, with each aspect having a constraint.
- [c3] 3. The method according to claim 1, wherein each negotiating context is associated with a parameter and a term describing an aspect of the value of the parameter in the invocation pattern.
- [c4] 4. The method according to claim 1, wherein each decision point in the graph has one or more parent nodes that must all be negotiation contexts.
- [c5] 5. The method according to claim 4, wherein each negotiation context in the graph has one or no parent node that must be a decision point.
- [c6] 6. The method according to claim 5, wherein the negotiation context with no parent node is a root node that is not the result of a decision.
- [c7] 7. The method according to claim 4, wherein each decision point is a hyper-arc.

- [c8] 8. The method according to claim 1, wherein the primitives define a protocol for collaboratively building a graph at each participant.
- [c9] 9. The method according to claim 8, wherein the graph built at each participant contains only properties of parameters in its invocation pattern.
- [c10] 10. The method according to claim 1, wherein each negotiation context in the graph is labeled with one or more pairs of: an aspect on a parameter, and a property constraining the aspect's value.
- [c11] 11. A system for carrying out a negotiation between a plurality of participants, comprising:
means for defining an invocation pattern for each participant; each invocation pattern being a tuple having at least a name and a set of parameters;
means for attaching a set of coordinator parameters to each invocation pattern; the set of coordinator parameters defining interdependencies between parameters of the plurality of participants that are shared across their invocation patterns;
means for constructing a graph to negotiate a set of actions to be performed by selected ones of the plurality of participants; the graph being constructed with nodes of one of a first node type representing a negotiating context and a second node type representing a decision point;
wherein the graph is constructed by the participants with primitives instantiated by the invocation patterns that are used to negotiate values of parameters; and
wherein at least one node in the graph is a decision point that merges two or more negotiation contexts into a single decision point; the single decision point combining values of the parameters from the two or more negotiation contexts.
- [c12] 12. The system according to claim 11, wherein properties of each parameter are defined by a set of one or more aspects, with each aspect having a constraint.
- [c13] 13. The system according to claim 11, wherein each negotiating context is associated with a parameter and a term describing an aspect of the value of the parameter in the invocation pattern.
- [c14] 14. The system according to claim 11, wherein each decision point in the graph

has one or more parent nodes that must all be negotiation contexts.

- [c15] 15. The system according to claim 14, wherein each negotiation context in the graph has one or no parent node that must be a decision point.
- [c16] 16. The system according to claim 15, wherein the negotiation context with no parent node is a root node that is not the result of a decision.
- [c17] 17. The system according to claim 14, wherein each decision point is a hyper-arc.
- [c18] 18. The system according to claim 11, wherein the primitives define a protocol for collaboratively building a graph at each participant.
- [c19] 19. The system according to claim 18, wherein the graph built at each participant contains only properties of parameters in its invocation pattern.
- [c20] 20. The system according to claim 11, wherein each negotiation context in the graph is labeled with one or more pairs of: an aspect on a parameter, and a property constraining the aspect's value.